City of Berkeley

System Engineering Management Plan - DRAFT

VALUE PRICING PILOT PROGRAM PARKING PROJECT

V3.0

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Section 1
Purpose of Document

This is the base document of the Systems Engineering Management Plan (SEMP) for City of Berkeley's Value Pricing Pilot Program Parking Project. This base document contains information about the project and the guidelines for the management of it. Together with its appendices, these documents comprise the project SEMP.

The SEMP is intended to serve as a guidebook for the City of Berkeley's project team and its vendors throughout the course of the project. It follows the Systems Engineering approach to project management. The SEMP will identify tasks to be completed; summarize the project schedule, tasks, responsibilities; and set forth how the final products will be integrated, installed, verified, and maintained. The SEMP will enable the project team to manage the project using systems engineering principles and methods to maximize the quality of the system being implemented while minimizing the budget and schedule. The SEMP documents are living documents, so as the project progresses, some portions of the SEMP may be updated to reflect the most current data.

Section 2

Project Goals, Scope and Strategy

2.1 Goals

The primary goal of the Project is to influence driver behavior through pricing, time regulations and driver information. The specific goals for the project include:

- Improve customer satisfaction for drivers in terms of parking space availability and paying for parking;
- Better manage public and institutional parking resources;
- Reduce parking-related search traffic;
- Reduce or reallocate parking demand;
- Minimize adverse parking "spillover" effects in residential neighborhoods; and
- Develop a long-term management system, including automated enforcement, appropriate for the City of Berkeley, which has limited resources

The Project will be carried out in three distinct areas: Downtown Berkeley, Telegraph Avenue/Southside, and the Elmwood District (Figure 1). Each of these areas has a different set of land uses, existing conditions and user needs. Parking management strategies will be customized to each area individually. As such, the goals for each area are listed separately in the Concept of Operations.

2.2 Strategies

The City will use three primary strategies to achieve its Project goals: better parking management, parking information, and enhanced enforcement.

Parking management – To better manage demand for on- and off-street parking, the City will use demand-responsive pricing of parking. Prices will be adjusted periodically and gradually to help meet availability targets so that drivers can, most of the time, quickly find available parking, whether on-street or in garages or lots. To complement demand-responsive pricing, other changes to parking management may include relaxation of time limits and other changes to parking regulations.

Parking information – To help drivers make more informed travel decisions before getting into the car or to help drivers efficiently find parking during a trip, the City will provide a new level of parking information. The City will improve on-street static parking signage, as well as wayfinding signage to off-street facilities. Information about parking location, availability, and price will be provided to drivers in a variety of ways, including a project website.

Enhanced enforcement – For on-street parking, good policies will be followed up with a consistent level of enforcement of those policies to help maximize their effectiveness. The City will explore enforcement techniques that are more efficient and effective than current methods, which will help to maximize the efficacy of the Project and aid subsequent evaluation of their effects.

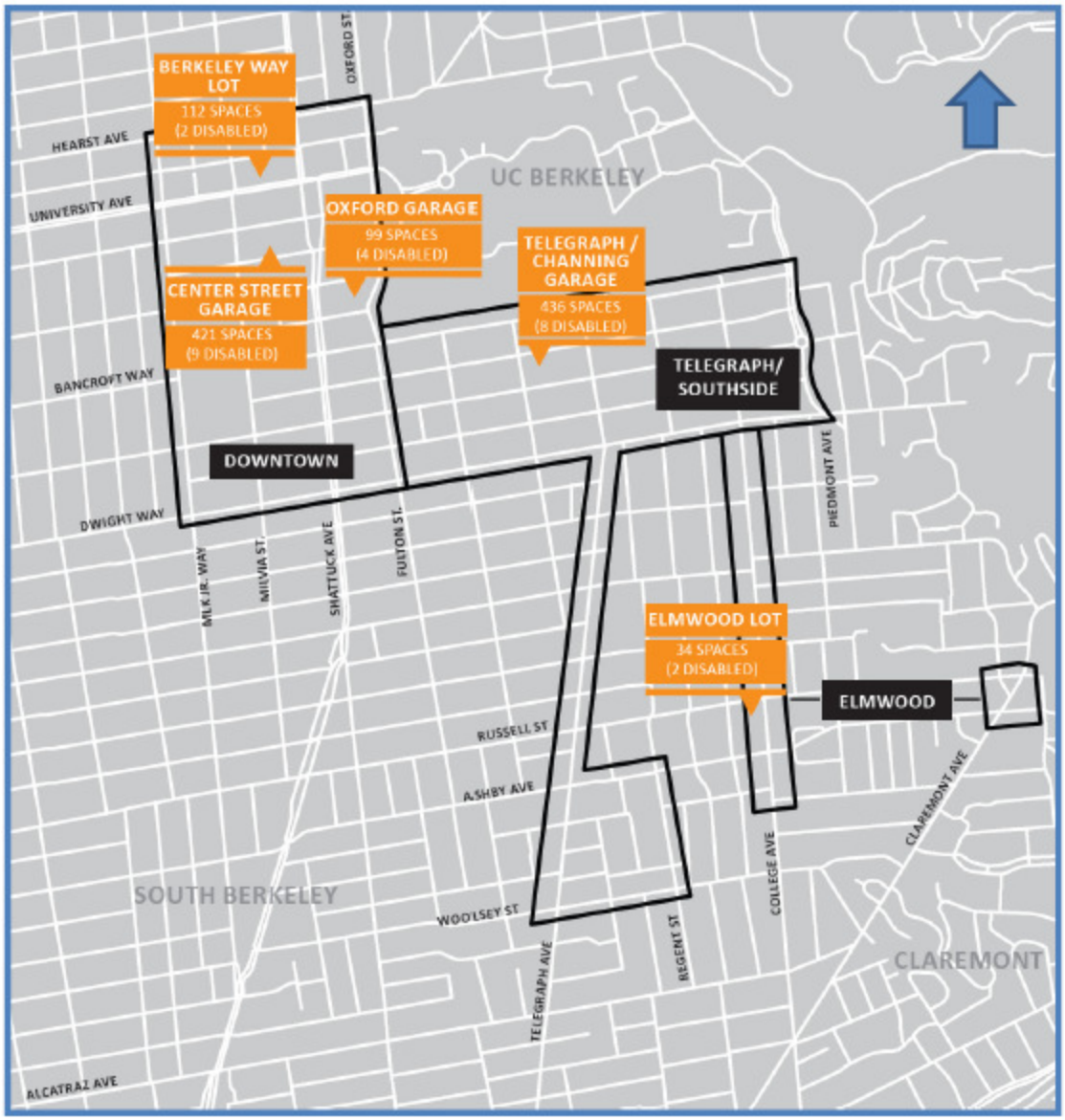


Figure 1 – Project Areas and City Parking Facilities

PROJECT AREAS

CITY PARKING FACILITIES

2.3 Scope

The City of Berkeley's Value Pricing Pilot Program(VPPP) Project (Project) will develop and implement a management plan that makes the most efficient use of the parking supply, provides better customer service in terms of payment options and space availability, and reduces congestion related to searching for a space. The Project will employ innovative pricing strategies, changes to time limits and re-allocation of curbside space so that at the end of the three-year Project, the City will have the information and community feedback necessary to develop long-term policies and procedures for parking management.

The project consists of three parts:

1. **Parking rate and time limit changes**. Standard data collection will supply a standalone database that will serve as the basis for immediate parking policy changes and application; and

2. **Long-term parking management system.** An automated data collection pilot will test and procure equipment for use by City staff. The data collection equipment will be used by the City in two ways: 1) to make more frequent data collection possible to support on-going parking policy changes; and 2) to improve enforcement of the new parking policies.

3. **Data Warehouse and automated data analysis.** When funds are available, the City will develop the requirements for and solicit a contractor to design and implement a data warehouse to capture all of the City's parking data and to support more regular analysis of the data for adjusting parking policy to enable the City to better achieve its parking goals.

This SEMP is intended to guide the ITS work of Part 2, referred to hereinafter as the Pilot.

Effective parking management is built on robust data collection and analysis. However, the collection of parking data by manual observation is time consuming and expensive. Data collected may be of limited use, since it is a snapshot of conditions instead of a true picture of parking patterns and conditions over a representative period. Once collected, the results often require analysis by parking experts that are hired as contractors by the City.

To address these issues, the automated data collection pilot will test various data collection technologies that are more economical and replicable than traditional manual data collection methods. The technologies will be tested for accuracy, cost, ease of use and integration into the City of Berkeley's on-going operations with specific attention to the City's current enforcement operations

The automated data collection will be validated using the manually collected data from either Part 1 or from the Part 2 System Integrator. The Part 1 data collection is explained in the Concept of Operations for this Project. This SEMP addresses the data collection called for within Part 2. This Part 2 data collection will enable the City to confirm that the use of technology can support long-term parking policy development such as parking rate changes, time limit adjustments, enforcement changes, driver information signs and guidance. If the Pilot testing is concurrent

with Part 1 of the Project, the Part 1 data will serve as the baseline. But since this timing is uncertain, this SEMP will call for the Part 2 System Integrator to collect manual data concurrently with automated data.

Section 3

Pilot Goals, Scope and Steps

3.1 Goals

The goals of the Pilot (Automated Data Collection and Enhanced Enforcement in support of the Long-Term Parking Management System) are:

- Test various data collection technologies and the corresponding data collection methods;
- Assess the degree of accuracy, frequency and cost of data collection of each technology and its corresponding method;
- Confirm that the data collected can be consolidated with other data sources to be used in data analysis;
- Determine how easily replicable the use of each technology is;
- Test the use of the same technologies to support more effective parking enforcement;
- Assess the degree of improved enforcement; the cost of enforcement corresponding to each technology; and the cost/benefit ratio of the use of each technology to the City; and
- Provide a recommendation of the best technology solution to enable the City to satisfactorily achieve development of parking goals via parking rate changes, time limit adjustments, enforcement changes, driver information signs and guidance.
- Procure and implement the recommended solution within the City.

3.2 Scope

The Pilot will be carried out by the City using two types of contracts: 1) a qualifications-based selected contract with a Integrator who will develop and execute the technology test; and 2) cotracts with pre-qualified technology vendors who will furnish their equipment for testing. This testing work constitutes Phase1 of the Pilot.

Once Phase 1 is completed by the Integrator, Phase 2 will commence. The City will select the desired technology and then negotiate a procurement and implementation with the technology vendor.

Upon the City's selection of one or two of the tested technologies, both the Integrator and technology vendor(s) will be requested to furnish a best and final offer for the implementation of the selected technology(ies). A decision to implement two technologies would be made by the City only if the test results indicated that the City's goals of data collection and enforcement could not be adequately met by a single technology.

3.3 Steps to Test Automated Data Collection

The steps involved in Pilot will be (refer to Figure 2):

Phase 1

1. Select and contract with a Integrator to design and implement the tests;

2. Solicit technology vendors to test their solutions following the test procedure developed by the System Integrator;

Phase 2

3. Enter into contracts with those vendors meeting minimum requirements for testing for the leasing of their proposed solution to be tested;

4. Conduct tests according to evaluation methods and performance standards as described in the RFP;

5. Validate the automatically collected data against the evaluation methods and performance standards as described in the RFP;

6. Determine the solution that best fulfills the City's requirements;

7. Amend the successful vendor(s)'s contract to include the procurement of their technology solution(s); and

8. Amend the Integrator contract to secure needed services in support of the implementation by the vendor(s).

3.4 Approach to SEMP updates

Given the 2-phase plan to have the Integrator test multiple technologies to determine the best fit with the City's requirements prior to any implementation, the SEMP will initially contain details sufficient to manage Phase 1 (the testing phase). The SEMP will then be updated for Phase 2 to reflect the specific management requirements needed for implementation of the selected technology(ies). To ensure that the implementation is successful, the Integrator will be asked to submit required documents prior to the start of implementation. The framework of the guidelines for these submittals is provided for in Appendicies C and D.

Figure 2 Proposed Procurement Process

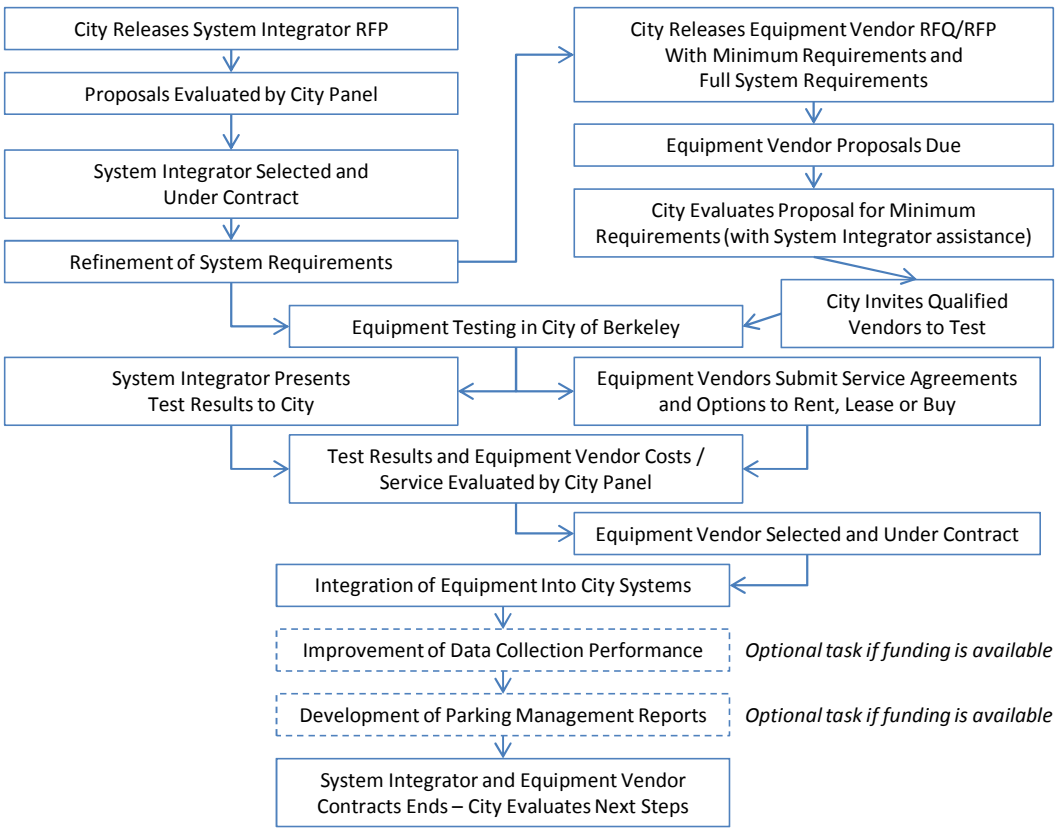
goBerkeley Automated Data Collection / Enforcement Pilot System
Proposed Procurement Process

System Integrator

1. Provide technical expertise to evaluate equipment
2. Assist the City with RFP for an Equipment Vendor by:
   a. Refine the City's existing system requirements, based on City's functional requirements
   b. Assist the City in testing equipment vendors against requirements
   c. Provide results of the test to the City with recommendations on purchase of the equipment (rent, lease, buy, etc.)
3. Work with the City's selected Equipment Vendor to:
   a. Integrate equipment into the City's existing systems (e.g. Citation Management and RPP Permit)
   b. Improve performance on the City's parking occupancy collection (if funding available)
   c. Provide reporting systems that automate the reporting of parking occupancy data to enable demand-responsive parking (if funding available)

Equipment Vendor

1. Provide data collection / enforcement (DC/E) equipment
2. Provide software and hardware for management and operation of (DC/E) equipment
3. Provide support for equipment and management systems
4. Participate in testing of systems against City's requirements
5. Work with the City (and the City's selected System Integrator to:
   a. Integrate equipment into the City's existing systems (e.g. Citation Management and RPP Permit)
   b. Improve performance on the City's parking occupancy collection (if funding available)
   c. Provide reporting systems that automate the reporting of parking occupancy data to enable demand-responsive parking (if funding available)



Section 4
Project Planning and Control

The City of Berkeley (City) will be responsible to ensure that the Automated Data Collection and Enhanced Enforcement Pilot (Pilot) is properly designed, developed, integrated, tested and evaluated. The City shall use the services of consultants to assist with making sure that this takes place. Even though the System Integration Contractor (Integrator) shall be contractually responsible to develop and closely adhere to their own engineering practices, the City and their consultants will have the capability to review and approve the Integrator's engineering practices and closely monitor these activities to ensure full compliance of the various procedures. The Integrator will in turn be responsible to monitor the various vendors to ensure that the test procedures are followed properly and that the conclusions reached are verifiable.

4.1 Control Gates

Control gates are milestones denoting specific formal approvals required before proceeding with an action or activity. The following table identifies the major control gates for the Pilot testing and implementation phases, the person who will authorize "opening the gate," and prerequisites for doing so. These Control Gates will be indentified and updated as part of the Detailed Schedule found in Appendix B-2.

Control Gates	Source of Authorization	Prerequisites
Concept of Operations and SEMP approval	FHWA	Detailed planning complete in accordance with Systems Engineering concepts including all technical plans.
Obligation of VPP Funds	Caltrans	FHWA approval of SEMP and NEPA clearance
Obligation of CMAQ Funds	Caltrans	MTC approval
Obligation of City Funds	City council	Staff recommendation
Approval of Integrator RFP Contract Advertisement	Berkeley City Council	Need to know that all the funds are obligated
Approval of Integrator RFP Contract Award	Berkeley City Council	Staff recommendation
Approval of Vendor Contract Advertisement	Berkeley City Council	Need to know that all the funds are obligated
Approval of Vendor Contract Awards	Berkeley City Council	Staff recommendation
Commence Data Collection	Berkeley Project Manager	Public outreach started, Detailed Design Document complete
Pilot Test and Acceptance	Berkeley Project Manager	System successfully passes acceptance criteria in the validation requirements
Approval of Integrator	Berkeley City Council	Staff recommendation

Contract Amendment		
Approval of Vendor Contract Amendment(s)	Berkeley City Council	Staff recommendation

4.2 Schedule Management

The City's project manager will maintain a detailed project schedule, including control gates and key milestones for both phases of the Pilot. The milestones will include those to which the Integrator and Vendors must comply. Once the Integrator is under contract, the Integrator will provide a detailed schedule demonstrating how he will meet the Pilot's implementation milestones. The City's Project Manager is authorized to adjust the schedule as needed during the development of the Project and the Pilot. The initial detailed schedule and its updates are found in Appendix B-2.

System Requirements

Task	Status
Funding Awarded	*June 29, 2012*
Authorization to Proceed (E-76) Issued for SEMP, Con Ops and System Requirements	*June 14, 2013*
Con Ops approval	*March 28, 2013*
System Requirements complete	*June 13, 2013*
SEMP approval	*June 14, 2013*
NEPA and CEQA Categorical Exclusions Approval	*November 7, 2012*

Integrator Request for Proposals (RFP)

Task	Status
Draft RFP	*April 10, 2013*
Release RFP/Start Advertising Period	*TBD*
Contract Approved	*TBD*
Notice to Proceed	*TBD*

Pilot Creation

Task	Status
Finalize technology and methodology tests	*TBD*
Create Factory Acceptance Tests for equipment	*TBD*
Complete system requirements for Vendors	*TBD*

Vendor Request for Proposals (RFP)

Task	Status
Draft RFP	*TBD*
Release RFP/Start Advertising Period	*TBD*
Contract Approved	*TBD*
Notice to Proceed	*TBD*

Pilot

Task	Status
Conduct Factory Acceptance Tests for equipment	*TBD*
Begin data collection	*TBD*
Conclude data collection	*TBD*
Evaluation of data	*TBD*
Evaluation of each methodology complete	*TBD*
Recommendation	*TBD*

Implementation

Task	Status
Amend contracts	*TBD*
Begin implementation	*TBD*

4.3 Cost Management

A summary-level of the funds anticipated for each of the major activity involved in the Pilot will be used by the Project Manager to manage the costs and funds on the Pilot. Each major activity within the schedule will have identified: the lead agency or contractor, the estimated cost, funding, and actual expenses as they become available. The Cost Management Plan is found in Appendix B-3. As the Pilot progresses, this plan will be updated to reflect actual or more accurate funding needs.

4.4 Risk Management

Risk management is the systematic process of planning for, identifying, analyzing, proactively addressing, and monitoring project risks. A project risk is the expectation of an uncertain event or condition that, if it occurs, can have a significantly negative or positive effect on a project objective.

Most risks are associated with negative outcomes, and can be called threats. The challenge in developing any project is to prevent the threatening condition from occurring, and mitigating its impact if it does happen.

Risks, normally viewed as threats, can also include uncertain events that result in a positive outcome. These can be thought of as opportunities rather than threats. An example is an unexpected funding windfall, or an unexpected low price for one or more major system components. In this case, the challenge is to facilitate occurrence of the opportunistic condition and to be in a position to take full advantage of it if it does occur.

The Project Manager will ensure that the Project Team creates the initial Risk Management Plan using the form provided in Appendix B-4. Once approved, it will become the updated Appendix B-4. Each risk identified will be assessed for the likelihood or probability of it occurring, and its potential impact on the project if it were to occur based upon a number scale of 1-4, from low to high. The Project Manager will assign responsibility to the appropriate team member for the action necessary to mitigate against the threats or to take advantage of the opportunities.

Section 5
Systems Engineering Process/Technical Control

The City will utilize the services of consultants to ensure that the appropriate System Engineering processes are followed. The City,its consultant, and its Integrator will follow these three areas of system engineering analysis:

1. System Requirements Analysis –the *Concept of Operations* has been developed and approved by the City and FHWA. This information will be provided to prospective Integrators as part of the RFP process. The information presented in the *Concept of Operations* document will be used during the development of the Pilot requirements, which are functional in nature. The City provided the draft system requirements document to the consultant's experienced parking system design staff to obtain important feedback and make certain that the requirements can be met by prospective bidders. The system requirements will be provided to prospective Integrators as part of the RFP package.

2. Design Synthesis – The Integrator will then use the various system related functional requirements as the basis for designing the Pilot. The City and their consultants shall closely oversee the Integrator's design process and will conduct several rounds of testing to ensure that all identified requirements are being met for each of the technologies/methods included in the Pilot. It is envisioned that the City's consultant will develop and utilize the comprehensive requirements trace matrix, which will be expanded by the Integrator, as the guide to ensure that the Integrator is designing the Pilot correctly.

3. System Analysis – During the Integrator's testing process, the City will monitor progress to quickly identify possible technical problems with proposed equipment, commercial off-the-shelf (COTS) hardware or software, and Integrator application software to be used in testing the Vendor technologies. If technical trade-offs need to be implemented, the Integrator shall follow procedures identified in the SEMP guidelines (below) and included as part of the RFP. The City will be required to approve the requested technical trade-off as proposed by the Integrator and recommended by the consultant.

5.1 SEMP Guidelines

The City has determined that the best way to ensure a successful Pilot is to develop various systems engineering guidelines that will be provided to and discussed with the Integrator.

The Phase 1 Guidelines listed in Table __ below are to guide the Integrator's test development and test implementation. The Integrator will be required to submit their planning and design work consistent with these guidelines. In order to convey to the Integrator the types of system engineering practices that they should utilize, various SEMP guideline documents have been developed.

Since the SEMP is a living document, it is expected that the following guidelines and plans will be updated and amended as the Integrator, Vendors, the City and its consultant determine the capabilities of the technologies and necessary resources.

Phase 1 Guidelines
A. Quality Management Plan
B. System Requirements
C. Data Collection and Evaluation Plan
D. Design Specifications, Interface Control, and System Integration Plan Guidelines
E. Verification Plan Guidelines
F. Configuration Management Plan Guidelines

The Phase 2 Guidelines listed in Table __ below are to guide the implementation of the selected technology(ies).

Phase 2 Guidelines
A. Quality Management Plan (same as that for Phase 1)
B. Verification Plan Guidelines – Phase 2
C. Operations, Maintenance, and Support Plan Guidelines
D. Deployment Plan Guidelines
E. Training Plan Guidelines

5.2 Document Control and Approval

The City will develop and implement an internal document review and approval process that will be applied to properly document the Pilot acceptance. The City's Project Manager will have the contractual and legal authority to sign off on all system engineering and management related aspects of the Pilot. The typical approval process will be as described below:

1. The Integrator shall be required to provide a particular document (such as the Plans for which the SEMP Guidelines have been provuded) to meet the Pilot timeframe as will be stated in the RFP.

2. The PM, or his/her designee, and the City's consultant will carefully review and provide one set of comments and/or suggested modifications on the document within thirty days of the draft submission . All comments will be compiled into a matrix/database for transmittal to the Integrator.

3. The PM, or his/her designee, and the City's consultant will either approve the document or ask the Integrator to make changes and re-submit the document for a second round of review. If changes are required, the comment matrix will be provided to the Integrator.

4. Following the Integrator's response to comments, the PM will then make the decision whether or not to officially approve the document and will inform, in writing, the Integrator Project Manager of that decision.

To enhance the ability of the City to closely track the Integrator's system engineering process, the Integrator will be required to provide a document management tool. This program will support the storage and retrieval of all types of project documents, including correspondence and e-mail messages. The program will also have the capability to segregate City's documents from general project documentation that can be accessed exclusively by the City and its consultant staff. It is envisioned that this system will be web based to allow the users to access the documents and files remotely to better facilitate the Integrator contract oversight effort.

Section 6

Critical Pilot Test Requirements

For the Pilot test, it is envisioned that a single Integrator would be selected to test the multiple technologies made available through a separate procurement process. The tests must demonstrate whether or not the tested technology has the ability to provide the following functions and meets the following goals:

- License plate recognition (LPR) of vehicles located in on-street parking spaces;
- Ability to determine occupancy of on-street parking spaces per blockface;
- Assess the degree of accuracy, frequency and cost of data collection of each technology and its corresponding method;
- Confirm that the data collected can be consolidated with other data sources to be used in data analysis;
- Determine how easily replicable the use of each technology is;
- Test the use of the same technologies to support more effective parking enforcement;
- Assess the degree of improved enforcement; the cost of enforcement corresponding to each technology; and the cost/benefit ratio of the use of each technology to the City;
- Determine ability o technologies to provide enforcement officers with data to determine whether or not a vehicle located in an on-street parking space should be issued a citation based on length of time of occupancy; and
- Provide a recommendation of the best technology solution to enable the City to satisfactorily achieve development of parking goals via parking rate changes, time limit adjustments, enforcement changes, driver information signs and guidance.

Section 7

System Operations and Maintenance

As part of the testing of the various technologies under the Pilot, the Pilot also must provide estimates of the future operation and maintenance costs for consideration in the decision to purchase and implement a recommended solution. The future operations and maintenance requirements will be detailed in the RFP so that the System Integrator will be prepared to deliver such services as requested by the City.

Appendices

Appendix A

Acronyms

City	City of Berkeley
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
FHWA	Federal Highway Administration
ITS	Intelligent Transportation Systems
LPR	License Plate Recognition
MTC	Metropolitan Transportation Commission
O&M	Operations and Maintenance
PARCS	Parking Access and Revenue Control System
PE	Agency Project Engineer
PEO	Parking Enforcement Officer
PM	City Project Manager for Parking Project
RFP	Request for Proposals
RFQ	Request for Qualifications
SEMP	Systems Engineering Management Plan
TDM	Transportation Demand Management
VMS	Variable Message Signs
VPPP	Value Pricing Pilot Program
WBS	Work Breakdown Structure

Appendix B

Project Controls

The goBerkeley pilot shall follow and be subject to project controls set forth in this Appendix as they relate to:

- Work Breakdown Structure
- Project Detailed Schedule
- Cost Management Plan
- Risk Management Plan

Appendix B-1
Work Breakdown Structure

The following Work Breakdown Structure (WBS) shows tasks for the entire Project, including the Parking Rate and Time Limit Changes. The WBS tasks that are related to the Pilot, and this SEMP, begin in Section 4: Long-Term Parking Management System

1. **Project Initiation**
   - 1.1. Develop scope of work for Berkeley Value Pricing Pilot Project (VPPP) Parking Pilot
   - 1.2. Develop coordination schedule for complementary Transportation Demand Management (TDM) Program
   - 1.3. Review process with FHWA
   - 1.4. City Council Ordinance for Parking Rate and Time Limit Changes
   - 1.5. Contract with vendors for Project Planning and Public Outreach / Marketing

Parking Rate and Time Limit Changes

2. **Planning for Parking Rate and Time Limit Changes**
   - 2.1. Contact staff from other cities for lessons learned in parking strategies and public outreach
   - 2.2. Develop Concept of Operations for pilot elements
   - 2.3. Develop Public Outreach / Branding / Marketing Plan
   - 2.4. Develop Public Website for notification and display of parking occupancy and rate data
   - 2.5. Develop data collection and evaluation plan to assess effects of parking rate and time limit changes
   - 2.6. Identify, plan and budget for implementation activities from operational units (e.g. meter programming, meter and sign information changes)
   - 2.7. Develop detailed implementation plans
     - Meter installation and programming
     - Signage changes
     - Public notification
     - Enforcement amnesty period

3. **Execution for Parking Rate and Time Limit Changes**
   - 3.1. Conduct RFP for manual data collection to measure effects of parking rate and time limit changes
   - 3.2. Collect baseline parking data
   - 3.3. Execute public outreach plan including Community Advisory Groups, Public Workshops, brochures and other collateral material
   - 3.4. Launch parking information (occupancy and rate) on public website
   - 3.5. Finalize parking rate and time limit changes by area
   - 3.6. Launch public education and notification campaign, including public website

3.7. Execute deployment and training plan
3.8. Execute operations and maintenance plan
3.9. Change signage and meter rate plates / stickers as necessary
3.10. Program meters with new parking rates and time limits
3.11. Institute parking ticket amnesty period, followed by regular enforcement
3.12. Collect post-implementation parking data
3.13. Present to public for feedback
3.14. Make adjustments to parking rate and time limit changes
3.15. Collect post-adjustment parking data
3.16. Present to public for feedback

Pilot: Long-Term Parking Management System

4. Planning for Long-Term Parking Management System

4.1. Obtain environmental evaluation from Caltrans
4.2. Conduct stakeholder interviews with City of Berkeley operational staff and representatives of community groups on user needs and constraints
4.3. Contact staff from cities operating parking pricing programs for lessons learned on technology
4.4. Develop Concept of Operations for pilot elements
4.5. Develop System Requirements for major operating units:
- Public Works, Transportation – Reliability and accuracy for automated data collection, analysis, reporting and driver information, reliability/accuracy
- Berkeley Police Department (BPD) – Compatibility with enforcement equipment, labor contracts, planned efficiency changes, reliability/accuracy for parking duration and other violations
- Berkeley IT Department – Storage, security, on-site maintenance of hardware and software to support Public Works and BPD

4.6. Develop System Engineering Management Plan
4.7. Develop enforcement plan including labor, equipment, technology buy-in

5. Execution for Long-Term Management System

5.1. Conduct RFP for system integrator to test, procure and integrate enforcement and automated data collection tools and systems. This RFP will include the system requirement plan and performance standards / parameters
5.2. Request demonstration of automated data collection / enforcement technologies on City of Berkeley streets against criteria established in the RFP
5.3. Select contractor to 1) test technology against requirements and performance standards of automated data collection and enforcement , 2) procure tools and services; and 3) integrate with existing City of Berkeley systems
5.4. Integrate chosen technology with Public Works, Berkeley Police Department and IT systems
5.5. Implement the deployment and training plan for technology and user interfaces

5.6. Implement the operations and maintenance plan for technology and user interfaces (optional depending upon availability of funding)

6. Conclusion

6.1. Develop operations, management, training and staffing plan for the long-term system of demand-based parking management

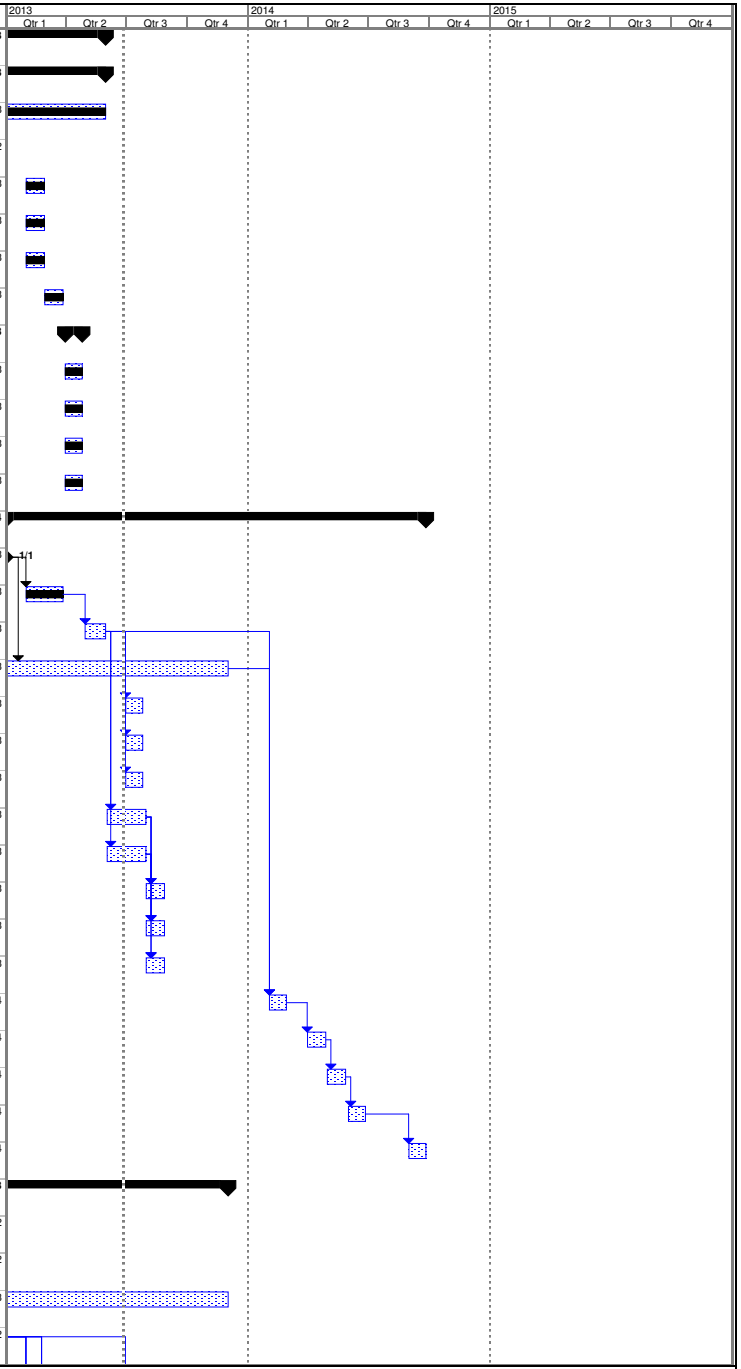
6.2. Develop estimated budget for the management of a long-term parking management program

6.3. Develop policies, procedures and guidelines for performing parking rate and time limit changes based on parking demand

6.4. Close out all vendor activities

Appendix B-2
Project Detailed Schedule

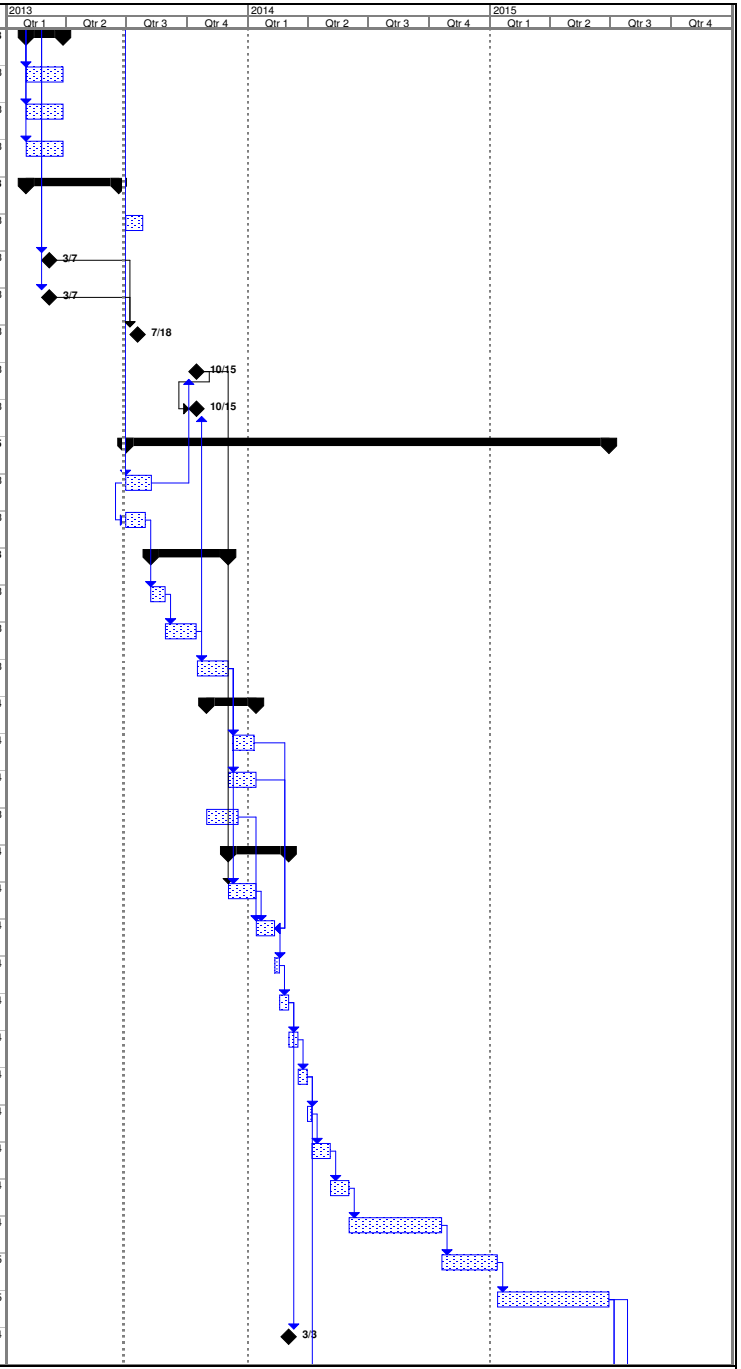
ID	WBS	Task Name	Duration	Start	Finish
7	**2**	**Parking Rate and Time Limit Changes**	**240 days**	**Mon 7/2/12**	**Fri 5/31/13**
8	**2.0**	**Planning for Parking Rate and Time Limit Changes**	**240 days**	**Mon 7/2/12**	**Fri 5/31/13**
9	2.1	Contact staff from other cities for lessons learned in parking strategies and public outreach	12 mons	Mon 7/2/12	Fri 5/31/13
10	2.2	Develop Concept of Operations for pilot elements	1 mon	Mon 12/3/12	Fri 12/28/12
11	2.3	Develop Public Outreach / Branding / Marketing Plan	1 mon	Fri 2/1/13	Thu 2/28/13
12	2.4	Develop Public Website for notification and display of parking occupancy and rate data	1 mon	Fri 2/1/13	Thu 2/28/13
13	2.5	Develop data collection and evaluation plan to assess effects of parking rate and time limit changes	1 mon	Fri 2/1/13	Thu 2/28/13
14	2.6	Identify, plan and budget for implementation activities from operational units (e.g. meter programming, meter and sign information changes)	1 mon	Fri 3/1/13	Thu 3/28/13
15	**2.7**	**Develop detailed implementation plans**	**20 days**	**Mon 4/1/13**	**Fri 4/26/13**
16	2.7.1	Meter installation and programming	1 mon	Mon 4/1/13	Fri 4/26/13
17	2.7.2	Signage changes	1 mon	Mon 4/1/13	Fri 4/26/13
18	2.7.3	Public notification	1 mon	Mon 4/1/13	Fri 4/26/13
19	2.7.4	Enforcement amnesty period	1 mon	Mon 4/1/13	Fri 4/26/13
20	**3**	**Execution for Parking Rate and Time Limit Changes**	**454 days**	**Tue 1/1/13**	**Fri 9/26/14**
21	3.1	Launch Parking Rate and Time Limit Changes	0 days	Tue 1/1/13	Tue 1/1/13
22	3.1	Conduct RFP for manual data collection to measure effects of parking rate and time limit changes	2 mons	Fri 2/1/13	Thu 3/28/13
23	3.2	Collect baseline parking data	23 days	Wed 5/1/13	Fri 5/31/13
24	3.3	Execute public outreach plan including Community Advisory Groups, Public Workshops, brochures and other collateral material	12 mons	Tue 1/1/13	Mon 12/2/13
25	3.4	Launch parking information (occupancy and rate) on public website	1 mon	Mon 7/1/13	Fri 7/26/13
26	3.5	Finalize parking rate and time limit changes by area	1 mon	Mon 7/1/13	Fri 7/26/13
27	3.6	Launch public education and notification campaign, including public website	1 mon	Mon 7/1/13	Fri 7/26/13
28	3.7	Execute deployment and training plan	43 days	Mon 6/3/13	Wed 7/31/13
29	3.8	Execute operations and maintenance plan	43 days	Mon 6/3/13	Wed 7/31/13
30	3.9	Change signage and meter rate plates / stickers as necessary	1 mon	Thu 8/1/13	Wed 8/28/13
31	3.10	Program meters with new parking rates and time limits	1 mon	Thu 8/1/13	Wed 8/28/13
32	3.11	Institute parking ticket amnesty period, followed by regular enforcement	1 mon	Thu 8/1/13	Wed 8/28/13
33	3.12	Collect post-implementation parking data	1 mon	Mon 2/3/14	Fri 2/28/14
34	3.13	Present to public for feedback	1 mon	Tue 4/1/14	Mon 4/28/14
35	3.14	Make adjustments to parking rate and time limit changes	1 mon	Thu 5/1/14	Wed 5/28/14
36	3.15	Collect post-adjustment parking data	1 mon	Mon 6/2/14	Fri 6/27/14
37	3.16	Present to public for feedback	1 mon	Mon 9/1/14	Fri 9/26/14
38	**4.0**	**Planning for Long-Term Parking Management System**	**349 days**	**Wed 8/1/12**	**Mon 12/2/13**
39	4.1	Obtain environmental evaluation from Caltrans	1 mon	Thu 11/1/12	Wed 11/28/12
40	4.2	Conduct stakeholder interviews with City of Berkeley operational staff and representatives of community groups on user needs and constraints	2 mons	Wed 8/1/12	Tue 9/25/12
41	4.3	Contact staff from cities operating parking pricing programs for lessons learned on technology	12 mons	Tue 1/1/13	Mon 12/2/13
42	4.4	Develop Concept of Operations for pilot elements	1 mon	Mon 12/3/12	Fri 12/28/12



Project: goBerkeley Parking Pilot Proje
Date: Wed 6/26/13

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

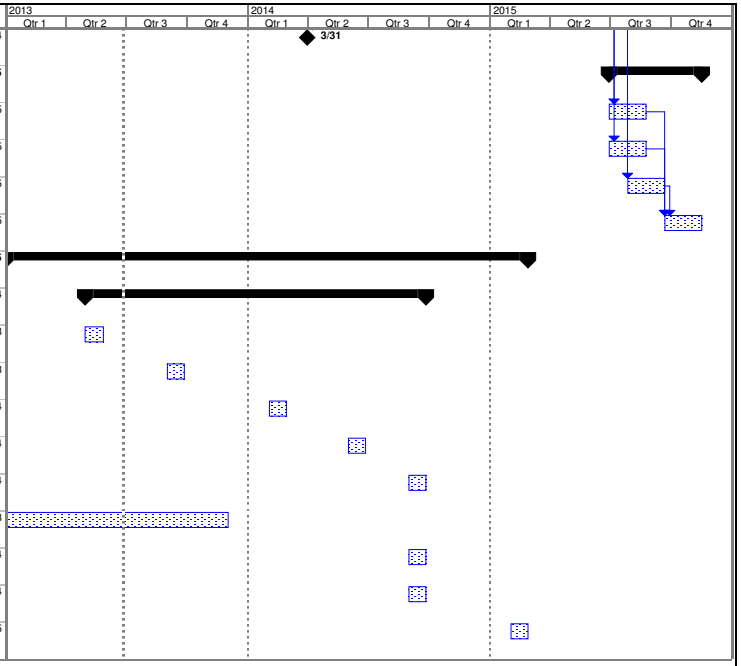
ID	WBS	Task Name	Duration	Start	Finish
43	**4.5**	**Develop System Requirements for major operating units:**	**40 days**	**Fri 2/1/13**	**Thu 3/28/13**
44	4.5.1	Public Works, Transportation – Reliability and accuracy for automated data collection, analysis, reporting and driver information, reliability/accuracy	40 days	Fri 2/1/13	Thu 3/28/13
45	4.5.2	Berkeley Police Department (BPD) – Compatibility with enforcement equipment, labor contracts, planned efficiency changes, reliability/accuracy for parking duration ar	40 days	Fri 2/1/13	Thu 3/28/13
46	4.5.3	Berkeley IT Department – Storage, security, on-site maintenance of hardware and software to support Public Works and BPD	40 days	Fri 2/1/13	Thu 3/28/13
47	**4.6**	**Develop System Engineering Management Plan (SEMP)**	**100 days**	**Fri 2/1/13**	**Thu 6/20/13**
54	4.7	Develop enforcement plan including labor, equipment, technology buy-in	1 mon	Mon 7/1/13	Fri 7/26/13
55	4.8	CONTROL GATE: City approves local funds for project	0 days	Thu 3/7/13	Thu 3/7/13
56	4.9	CONTROL GATE: MTC approves CMAQ funding	0 days	Thu 3/7/13	Thu 3/7/13
57	4.10	CONTROL GATE: E-76 continuation granted	0 days	Thu 7/18/13	Thu 7/18/13
58	4.11	CONTROL GATE: City Council approves advertisement of RFP	0 days	Tue 10/15/13	Tue 10/15/13
59	4.12	CONTROL GATE: City Council approves award of contract	0 days	Tue 10/15/13	Tue 10/15/13
60	**5**	**Execution for Long-Term Management System**	**521 days?**	**Mon 7/1/13**	**Mon 6/29/15**
61	5.1	Conduct RFP for system integrator to test, procure and integrate enforcement and automated data collection tools and systems. This RFP will include the system requirem	29 days	Mon 7/1/13	Thu 8/8/13
62	5.2	Release System Integrator RFP and respond to questions	22 days	Mon 7/1/13	Tue 7/30/13
63	**5.3**	**Select, approve and contract with System Integrator**	**83 days**	**Thu 8/8/13**	**Mon 12/2/13**
64	5.3.1	Select System Integrator	16 days	Thu 8/8/13	Thu 8/29/13
65	5.3.2	Secure Council Approval	33 days	Fri 8/30/13	Tue 10/15/13
66	5.3.3	Finalize contract	33 days	Thu 10/17/13	Mon 12/2/13
67	**5.4**	**Prepare for Equipment Vendor RFP**	**53 days?**	**Thu 10/31/13**	**Mon 1/13/14**
68	5.4.1	Refine System Requirements for Vendors	24 days	Tue 12/10/13	Fri 1/10/14
69	5.4.2	Develop, submit and secure approval of control plans	30 days	Tue 12/3/13	Mon 1/13/14
70	5.4.3	CONTROL GATE: City Council approves advertisement of RFP	34 days?	Thu 10/31/13	Tue 12/17/13
71	**5.5**	**Qualify Equipment Vendor technologies for testing**	**65 days**	**Tue 12/3/13**	**Mon 3/3/14**
72	5.5.1	Develop Vendor RFP	30 days	Tue 12/3/13	Mon 1/13/14
73	5.5.2	Release Vendor RFP	20 days	Tue 1/14/14	Mon 2/10/14
74	5.5.3	Select minimum qualified vendors	5 days	Tue 2/11/14	Mon 2/17/14
75	5.5.4	City invites successful vendors to supply equipment	10 days	Tue 2/18/14	Mon 3/3/14
76	5.6	Conduct test of equipment	10 days	Tue 3/4/14	Mon 3/17/14
77	5.7	Presentation of test results to City	10 days	Tue 3/18/14	Mon 3/31/14
78	5.8	Selection panel evaluates Vendor equipment and proposals	5 days	Tue 4/1/14	Mon 4/7/14
79	5.9	Contract with selected Vendor(s)	20 days	Tue 4/8/14	Mon 5/5/14
80	5.10	Vendor(s) provide equipment to System Integrator	20 days	Tue 5/6/14	Mon 6/2/14
81	5.4	Integrate chosen technology with Public Works, Berkeley Police Department and IT systems	5 mons	Tue 6/3/14	Mon 10/20/14
82	5.5	Implement the deployment and training plan for technology and user interfaces	3 mons	Tue 10/21/14	Mon 1/12/15
83	5.6	Implement the operations and maintenance plan for technology and user interfaces	6 mons	Tue 1/13/15	Mon 6/29/15
84	5.14	CONTROL GATE: Commence automated data collection as approved by PM	0 days	Mon 3/3/14	Mon 3/3/14



Project: goBerkeley Parking Pilot Proje
Date: Wed 6/26/13

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ID	WBS	Task Name	Duration	Start	Finish
85	5.15	CONTROL GATE: Pilot Test and Acceptance	0 days	Mon 3/31/14	Mon 3/31/14
86	**6**	**Conclusion**	**100 days**	**Tue 6/30/15**	**Mon 11/16/15**
87	6.1	Develop operations, management, training and staffing plan for the long-term system of demand-based parking management	2 mons	Tue 6/30/15	Mon 8/24/15
88	6.2	Develop estimated budget for the management of a long-term parking management program	2 mons	Tue 6/30/15	Mon 8/24/15
89	6.3	Develop policies, procedures and guidelines for performing parking rate and time limit changes based on parking demand	2 mons	Tue 7/28/15	Mon 9/21/15
90	6.4	Close out all vendor activities	2 mons	Tue 9/22/15	Mon 11/16/15
91	**7**	**Evaluation**	**564 days**	**Tue 1/1/13**	**Fri 2/27/15**
92	**7.1**	**Measure changes in parking occupancy (manual data collection, automated data collection), spillover effects (enforcement) and community feedback**	**368 days**	**Wed 5/1/13**	**Fri 9/26/14**
93	7.1.1	Measure changes in parking occupancy (manual data collection, automated data collection), spillover effects (enforcement) and community feedback	1 mon	Wed 5/1/13	Tue 5/28/13
94	7.1.2	Measure changes in parking occupancy	1 mon	Mon 9/2/13	Fri 9/27/13
95	7.1.3	Measure changes in parking occupancy	1 mon	Mon 2/3/14	Fri 2/28/14
96	7.1.4	Measure changes in parking occupancy	1 mon	Mon 6/2/14	Fri 6/27/14
97	7.1.5	Measure changes in parking occupancy Report	1 mon	Mon 9/1/14	Fri 9/26/14
98	7.2	Gather feedback from stakeholders – operational City units and community stakeholders	12 mons	Tue 1/1/13	Mon 12/2/13
99	7.3	Measure changes in parking and enforcement revenue and expenditures	1 mon	Mon 9/1/14	Fri 9/26/14
100	7.4	Measure effects of parallel Transportation Demand Management program	1 mon	Mon 9/1/14	Fri 9/26/14
101	7.5	Submit Final Report to FHWA, MTC, City Council and General Public	1 mon	Mon 2/2/15	Fri 2/27/15



Project: goBerkeley Parking Pilot Proje
Date: Wed 6/26/13

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Appendix B-3
Cost Management Plan

Task	Budget
Project Management and Agency Coordination	$225,000
Project Planning	$100,000
Public Outreach, Branding and Marketing	Part of MTC/CMAQ Grant Budget
Parking Data Collection	Part of MTC/CMAQ Grant Budget
Automated Data Collection / Enhanced Enforcement Pilot	$600,000 (MTC /CMAQ Grant will contribute $200,000)
Complementary Transportation Demand Management	Part of MTC/CMAQ Grant Budget
Parking Signage and Driver Information Changes	$100,000
Evaluation	$100,000
Total VPPP Budget	**$1,125,000**
VPPP Award (80%)	**$900,000**
City of Berkeley Match (20%)	**$225,000**

Appendix B-4
Risk Management Plan

The following table identifies major risks, their causes, and planned mitigation measures to address the risks. The likelihood of their occurrence, and their potential impacts, are ranked on a scale of 1-4, from low to high.

Risk	Causes	Proba-bility	Impact	Mitigation
City/Internal				
Internal staffing resources issue	Insufficient budget	Unlikely	3	Leverage more project work to be conducted by vendor, ensure ability to quickly hire outside staff, employ interns, and adjust schedules as necessary.
Insufficient budget	Unknown technology issues, potential integration problems with City systems	Likely	4	Phased approach to technology procurement will ensure technology satisfies requirements before procurement and integration; RFP will clearly state details of the City's existing systems for cost proposal and subsequent adjustment of pilot goals. Contract will be milestone-based, with task orders activated based on completion of pre-requisite tasks.
RFP Approval Delay	Unanticipated requirements, sign-off delays, inter-department coordination issues	Likely	2	Focus resources on RFP when potential delays are anticipated or experienced.
RFP Execution Delay	Unforeseen internal reviews by various City departments	Likely	2	Early warning to top City management to get involved if necessary and scheduling of additional time for City Council review.
City/External				
Privacy concerns	Residents and/or patrons grow concerned about privacy of data	Unlikely	2	Adhere to the City's data management policies to ensure proper use, security and disposal of data.

Risk	Causes	Proba-bility	Impact	Mitigation
Public concern over enforcement of time limits	Most motorists are unaware of time limit laws which state that they must relocate their vehicles (no "meter feeding", and must move their vehicles off the block in RPP zones	Likely	2	The deployment of the system for enforcement must be accompanied by a public education campaign and /or signage to notify the public of the existing laws.
Federal				
Delay in reviews / funding	Delay in processing or meeting requirements to obligate funds	Unlikely	4	Work closely with Caltrans and FHWA to monitor status. Provide all documents in a timely manner.
Integrator				
Vendor bankruptcy or acquisition	Vendor financially unstable; vendor purchased by another company	Unlikely	3	Employ reputable vendor with sound business model and history of experience. Include contract provisions for bankruptcy and acquisitions. Performance bonding.
Lack of market interest/expertise	As a demonstration project, technology is not readily in place in other locations	Likely	3	Select vendor with experience in related new technology and strategies. Be proactive in reviewing technology and implementation plans. Set minimum experience requirements. Write RFP requirements that do not preclude vendors from responding.
Potential patent issues	Lack of vendor research	Unlikely	4	Obligate vendors to recognize and remedy all potential patent issues related to project technologies/plans.
Problem developing effective test methods to serve as basis of comparison	Lack of similarities between technologies	Unlikely	3	Bring on expertise through Integrator, focus on realistic functional requirements instead of specific testing metrics, i.e. "occupancy per blockface per time perod" instead of "real-time occupancy per space."

Risk	Causes	Proba-bility	Impact	Mitigation
User(s)				
PEO staff unwilling/unable to deploy technology for enforcement or data collection	Lack of PEO staff, lack of PEO training, or violation of union rules and contracts	Unlikely	3	Develop functional requirements with City's parking enforcement staff and involve parking enforcement staff in evaluation of technologies. Develop training plans with parking enforcement staff and provide periodic updates.
City parking staff unable to access results of parking data collection to adjust rates and regulations	Automated data collection results are not produced in a format that is accessible/usable by City parking staff	Unlikely	2	Functional requirements will be developed to allow parking staff to make decisions based on results of automated data collection, including specified summaries of data. Integrator will be tasked with ensuring compatibility with parking staff user needs.
Technology				
Available technologies are not able to meet functional requirements	Available technology has not been customized to the needs fo the City	Likely	4	Phase approach to test available technologies and work with Integrator and Vendor to customize/upgrade technology to satisfy as many functional requirements as budget allows.
Delays in development of testing plan	Lack of expertise in developing a fair, accurate and revealing testing pan	Unlikely	4	Integrator will be responsible for bringing on technical expertise, which will be balanced by the City's functional requirements and commitment to fair procurement processes.

Appendix C
Guidelines for Testing

The goBerkeley pilot shall follow and be subject to testing guidelines set forth in this Appendix as they relate to:

- Quality Management Plan Guidelines
- System Requirements
- Data Collection and Evaluation Plan Guidelines
- Design Specifications, Interface Control, and System Integration Plan Guidelines
- Verification Plan Guidelines
- Configuration Management Plan Guidelines

Appendix C-1
Quality Management Plan Guidelines

GENERAL

The Quality Management Plan (QMP) developed consistent with these Guidelines will identify the **goBerkeley Automated Data Collection and Enforcement Pilot** quality related objectives including plans to achieve and measure these objectives. It will identify the roles and responsibilities of each group that will work on this project and define the different types of quality-related processes to be implemented and adhered to by the Contractor (Integrator).

This QMP describes the quality procedures to be followed by City management and the selected Integrator in carrying out and successfully testing and assessment of parking data collection technology.

Roles and Responsibilities

The Pilot Quality Management (QM) responsibility shall be distributed across all participants of the program including the City, the system engineering consultants and the Integrator. However, the Integrator shall be fully responsible to develop the QM procedures and guidelines and strictly adhere to these documents throughout the course of the system design, development, and testing phases of the Pilot. The City's primary responsibility shall be to ensure that the various QM procedures are followed by the Integrator. This will ensure that the assessment meets with the City's requirements.

QUALITY POLICY

The general QM policy of "high quality, objective and professional services tailored to the needs of the City," which will be identified in the QM procedures, shall be applied to the Pilot.

Quality Management Organization

All members of the Pilot team have the responsibility to ensure that work conducted on the project is of the highest quality. The Integrator Project Manager (IPM) has overall responsibility to ensure that the QM procedures are adhered to. The IPM will have the assistance of the Project Quality Manager who will have responsibility for implementing and monitoring the QM process.

The IPM and the Quality Manager shall also have a direct interface on all quality-related matters with the City Quality Assurance/Quality Control (QA/QC) project staff. Listed below

are suggested starting points for defining organizational responsibilities pertaining to the QM activities that are required to ensure program success.

City of Berkeley (City)

The City PM shall have full contractual responsibility for all Pilot QM activities and will work closely with the consultant staff and Integrator personnel to ensure that full quality control is adhered to during the system design, development, integration, testing, installation and deployment phases of the Pilot.

Project Consultant Staff

The City's system engineering consultant shall have, at a minimum, the following roles and responsibilities:

a. Shall ensure quality objectives are met on this project.

b. Shall identify each of the applicable policies and procedures as part of the International Standards Organization (ISO) 9001: 1994 Standards.

c. Participate in all facets of QA/QC activities and provide recommendations to the ED for verification of QM features of the project.

d. Provide QM guidance to the Integrator and City during the system design, development, testing, and assessment.

e. Provide regulatory guidance for QM related requirements in conjunction with City staff.

Integrator Systems Engineering Staff

The Integrator engineering personnel for the Pilot shall have the following roles and responsibilities:

1. Develop a detailed QM manual based on the ISO 9001 1994 standards for review and approval by the City.
2. Identify and document the relevant specific QA/QC procedures and guidelines that are necessary to satisfy all of the project-specific operating requirements.
3. Identify the control documents for management of quality.
4. Carry out Project-specific QM procedures enabling quality audits.

Technology Vendors

The Technology Vendors/Suppliers for the Pilot shall have the following roles and responsibilities:

1. Furnish QM practices as applied during the development of the technology.
2. Identify and document the relevant specific QA/QC procedures and guidelines that are necessary to satisfy all of the project-specific operating requirements by providing some customization of the technology.
3. Identify the control documents for management of quality.
4. Carry out Project-specific QM procedures enabling quality audits.

QUALITY ASSURANCE AND CONTROL REVIEWS

Methodologies and Standards

In addition to the policy and people, the QMP will define the Pilot's QM procedures. The QM procedures will be developed by the Integrator and subject to City review and written approval. They shall provide the specific approach to ensure that quality objectives are met on the Project in accordance with each of the applicable ISO 9001 1994 Standards policies and procedures. The Integrator shall apply these QM procedures.

Quality Assessment and Reviews

The Integrator proposal and contract preparation phases of the Pilot shall be completed according to the same type of system (QM procedures and guidelines) stated above. The Integrator's proposal shall clearly indicate that a QMP will be developed and a QA/QC program implemented during all phases of the Pilot. This QA/QC program shall indicate how the Integrator will address changes to the scope of services on the Project requested by either the City or the Integrator.

Quality Assurance and Control Milestones

The Integrator RFP will include the system design, development, testing and assessment milestones for the Pilot. Reaching each of the specified milestones will trigger a pre-determined payment from the City to the Integrator. The required QM and QA/QC procedures and guidelines that shall be utilized by the Integrator shall be clearly described in the Proposal and the contract to ensure that meeting the stated procedures is an important milestone to the Contract.

System Integrator Controls

The IPM shall direct the implementation of the approved QMP, which will execute the following QM and QA/QC procedures to ensure the proper level of quality is maintained throughout the project.

Design Control

Quality Process as defined in the QMP shall govern the control of the system design, development, testing, and assessment work to be completed on this project.

Document and Data Control

The Integrator shall implement various document and data control procedures as part of the QM and QA/QC process. Quality policy addresses the requirement to track electronic communications, physical documents, and communication records. Procedures shall address the issues that are related to automatically tracking Integrator Pilot documents.

Purchasing Control

Any direct purchasing for the project shall follow QMP direction which applies. All approvals and processing of purchases that will be charged to the project shall adhere to the existing City policy. In the event that subcontractors are used on the Pilot, the procedure to procure and control these services and/or equipment or software shall be established according to the QMP. Most project-related purchases for materials used by the system Integrator shall be managed by the Integrator and will adhere to the various QM and QA/QC procedures that have been previously established by the Integrator and approved, in writing, by the City.

Corrective Actions

The QMP shall clearly identify the various processes and products that will be used by the Integrator to identify any defects and methods of corrective action to resolve such defects.

The QMP will identify the ISO standards that should be followed in the Integrator's QM and QA/QC procedures and guidelines. The QMP shall also identify specific products to be utilized to track, monitor and document resolutions in a structured manner.

Quality Audits

Internal Quality Audits are required to prove that the QA/QC procedures in effect are working effectively. Some audits will be performed by the IPM or the QM team on items that are controlled by other project team members, including hardware and software group supervisors. Audits on areas that are within the scope of influence of the IPM and specific QM team members shall be conducted by personnel that have not conducted actual work on the system design, development, etc. This will ensure that staff that has performed the actual work is not checking the work in question.

Audit reports shall be made available by the Integrator to the City when requested. The following is an example of the internal quality audit framework that should be followed on the Pilot:

1. Internal quality audits by the IPM and staff will be conducted at an interval not to exceed three months.
2. Quality audits conducted by the IPM and QM staff shall be conducted at an interval not to exceed six months.
3. The quality audit reports shall be developed by the Integrator and submitted to the City for review and approval. Once approved, it shall be distributed to all Pilot team members.

4. The report shall contain, as a minimum, recommendations for improvements to the various quality procedures that have been used as the basis for the development of the audit report. The reports will be prepared according to the relevant ISO standards.
5. The audit will be conducted to follow an established format that has been proposed by the Integrator and approved by the City within the QMP.

Appendix C-2
System Requirements

The system and functional requirements listed in this section are derived from discussions with pilot stakeholders and reference the Project's Concept of Operations, Section 9.0 User Needs, where applicable, in parentheses (i.e. 9.3.2.1 Mobile Data Collection Units – Clearly identify a unique vehicle). It should be noted that the user needs in the Concept of Operations were developed for the entire Project and includes the Parking Rate and Time Limit Changes. System and function requirements below are only listed for the ITS-related Pilot for the system as a whole, including requirements that may be met by either the System Integrator, Equipment Vendor or both..

These System Requirements will be further defined by the pilot's System Integrator to assist the City in procurement of an equipment vendor. Appendix C-2 of the SEMP will be updated with requirements for the equipment vendor when available.

1.0 System Requirements and Business Deliverables

1.1 Public Works, Transportation

The following are requirements for parking data collection equipment that must be fully automated i.e. without requiring action from an operator

1.1.1 Detect the presence of a parallel parked vehicle in situations where parked vehicle bumpers are at least 6 inches apart - defined as a stationary vehicle with curbside wheels parallel and no further than 18 inches from the curb edge

1.1.2 Detect the presence of an angle parked vehicle - defined as a stationary vehicle (angled between 45 and 90 degrees) with curbside wheels no further than 18 inches from the curb edge

1.1.3 Record and store the date, day and time of the detection of a parked vehicle in the following format (04/15/2013, Monday, 20:15:36)

1.1.4 Detect the presence of a parked vehicle, notwithstanding changes in illumination (shadows, sunlight, glare, day/night lighting transition)

1.1.5 Detect a vehicle, the length of the vehicle notwithstanding ("Smart" Cars to tractor-trailer trucks, bicycles are NOT defined as vehicles in these requirements)

1.1.6 Detect a vehicle on both one-way and two-way roadways

1.1.7 Differentiate between stationary and moving vehicles

1.1.8 Report the blockface where the vehicle is located

1.1.9 Calculate the number of stationary vehicles per blockface for a given time period (e.g. 30 minutes, 60 minutes, 9 a.m. to 12 p.m., daily, monthly, yearly)

1.1.10 Integrate with the Pilot's parking regulation and capacity database. At a minimum, the parking regulation and capacity database will list the number of legal parking spaces per blockface with a unique blockface ID

1.1.11 Calculate the "parking occupancy" per blockface per time period, defined as (number of stationary vehicles) /(number of legal parking spaces)

1.1.12 Calculate the average "parking duration" per blockface per time period, defined as the average of parking duration of all stationary vehicles on a blockface for a time period
1.1.13 Differentiate between legal and illegal parking zones (desired, not required)
1.1.14 Report whether a vehicle is parked in a legal or illegal parkign zone (desired, not required)

1.2 Police Department, Parking Enforcement

1.2.1 Provide a unique identifier for each vehicle (such as license plate, make, model, color or tire air-valve position) if detected as a parked vehicle, defined in 1.1.1 and 1.1.2 above
1.2.2 Record and store the exact state and number of a license plate
1.2.3 Integrate with current parking regulations information to automatically detect a parking time limit violation
1.2.4 Integrate with current Residential Permit Parking (RPP) regulations to determine a permit zone violation; and a parking time limit violation within an RPP zone
1.2.5 Recorded data should be displayed to the Parking Enforcement Officer on their handheld computer in real-time
1.2.6 Report violation "alarms" that result from integration of recorded data with parking regulations to the Parking Enforcement Officer's handheld Computer in real-time
1.2.7 Allow PEO ability to override an alarm and enter an "exception" note or report
1.2.8 Generate daily, weekly, monthly and annual statistical reports detailing but not limited to:
1.2.8.1 total number of vehicle license plate reads
1.2.8.2 total number of parking violations issued as a result of read vehicle license plate data. The report shall separate data for each Berkeley Municipal Code (BMC)
1.2.8.3 total number of citations issued as a direct result of vehicle identification data stored in the handheld device
1.2.8.4 total number of enforceable violations identified by system but citations “not issued”
1.2.8.5 all statistical reports shall include individual PEO enforcement activity and performance

1.3 Department of Information Technology

The following requirements are listed for the “back-end” or management system of the technology / equipment.

1.3.1 Fully host supporting networks and systems outside of the City of Berkeley network.
1.3.2 Provide high availability and configured according to industry standard 99.999% of uptime or less than five (5) minutes of downtime per year.
1.3.3 Provide adequate disaster recovery and take routine backups of the system with a four (4) hour Recovery Point Objective (RPO) and an eight (8) hour Recovery Time Objective (RTO).
1.3.4 Provide security in accordance with industry standard SSAE 16 Type II for hosted solutions. Provider will protect system with the appropriate industry standard security provisions including firewall protection, AES 256 bit data encryption, antivirus protection, logging access of data and manipulation of data.
1.3.5 Provide means to authenticate City personnel to access the equipment/service management system. The solution must allow for future integration in Active Directory (LDAP).

1.3.6 Provide a way to log different activities including, but not limited to, user authentication, file modification, user activity. Additionally, the system must provide a way to turn logging up such that debugging events may be achieved.
1.3.7 Use virtualization technology that is compatible with VMware.
1.3.8 Provide ample processing power with the ability to dynamically scale CPU resources as needed.
1.3.9 Provide disk space that is in accordance with the specifications listed in this document.
1.3.10 Be scalable such that when addition resources such as processing power, memory allocation, or disk space are needed; the system will dynamically scale accordingly.
1.3.11 Provider will provide the appropriate bandwidth to meet or exceed the desired level of service detailed in this document.
1.3.12 Provide City staff access to the system to perform any data manipulation that may be required. Ideally, this will be administered in a web based platform.
1.3.13 Provide an overall architecture that is simplistic and in line with industry best practices. The design should use open standards protocols.
1.3.14 Provide maintenance of the system such that service packs and patches are applied in a timely fashion. The provider is responsible for the health of the Operating System and Core applications.
1.3.15 Provide data ouput that is compatible with the latest versions Microsoft SQL. As the new versions of Microsoft SQL become available, the provider will ensure compatibility. The proposed system should provide a way to store custom data elements and to enforce validation and business rules for that data. The system should further support the ability to include that data in reports and dashboards.
1.3.16 Provide a data output that is compatible with ESRI data models.
1.3.17 Adhere to UML documentation standards for workflow improvement and technology implementation projects and provide the proposed process flow and high level technical specifications for interface assumptions/requirements, required 3rd party components/services, and data exchange mechanisms.

2.0 System Integration, Data Analysis and Reporting Tools

2.0.1 Public Works, Transportation

Integrate the following data sources (9.4.2.1, 9.4.2.2):

- Manual Data
- Meter Transaction Data
- Garage Data
- City's blockface identification system
- Data analysis and reporting tools to be built as part of the "System Integration" tasks

Integrated data on parking occupancy, turnover, rates and regulations must be exported in formats consistent with:

- ESRI/ArcGIS map format (9.1.1)

- Display on the Project's website (9.1.1)

2.0.2 Police Department, Parking Enforcement

Integrate the following data sources:

- RPP Parking Permit and Inventory Database (9.3.2.6, 9.3.2.7)
- Xerox Parking Citation Management System (9.3.2.6, 9.3.2.7)
- Scofflaw (i.e. five (5) or more delinquent citations) Violator data – Paylock Booting System

Appendix C-3
Data Collection and Evaluation Plan Guidelines

For the Pilot test, the methodology of how the data is collected and evaluated will impact the decisions for selecting the new technology. For true comparisons of various technologies to be possible in an open environment (live on-street parking), each equipment/system involved in the testing must be presented with the identical situation at the same time. In addition, a baseline of data collected manually shall be performed at the same time the electronic systems are collecting their data.

- To accomplish this, the Integrator selected to perform the testing shall develop a plan that details:
- How the multiple technologies will be mounted on existing City equipment or infrastructure ,
- How the electronically collected data will be recorded and then transferred to an external network for analysis.
- How manually collected data for baseline comparison of the automatically collected data will be recorded in real-time and then converted to an electronic format and posted to an external network for analysis.

The Integrator shall develop an evaluation plan to examine the electronic and manually collected data. The resulting data and evaluation plan developed by the Integrator shall enable them to make recommendations to the City as to which technology solutions would be the most accurate, reliable, cost-effective, easy to operate, and maintain. The evaluation plan shall include but not be limited to the following:

- For each technology/system tested, an overall comparison of accuracy when compared to the baseline manually collected data,
- For each technology/system tested, an overall comparison of resources/cost required to operate,
- For each technology/system tested, a log of each preventative maintenance event along with any associated labor/material costs, and
- For each technology/system tested, a log of each non-preventative maintenance event (repair) along with any associated labor/material costs.

Appendix C-4

Design Specifications, Interface Control, and System Integration Plan Guidelines

While permanent acquisition and use of the recommended technologies and methods is not planned until the Pilot test is concluded, the consideration of future design specifications, interface control and system integration is a consideration in the event of a decision to purchase the recommended solution. The future design, interface and integration requirements will be clearly described in the RFP so that the Integrator will be prepared to determine and assess each technology and its corresponding method's design, interface and integration requirements.

Appendix C-5
Verification Plan Guidelines

GENERAL

This document will present the Pilot equipment and system verification testing process. It will outline the different types of tests that shall be conducted and identify the roles and responsibilities of each group that will be working on this project.

Roles and Responsibilities

Based upon the recommended distributed responsibility for the successful implementation of test procedures to ensure that the delivered technology operates according to the Request for Proposal (RFP) and Contract requirements, the Pilot organization will have various roles and responsibilities. Listed below are recommended starting points for defining organizational responsibilities pertaining to the verification test activities that are required to ensure program success.

CITY PERSONNEL AND/OR PROJECT CONSULTANT STAFF

The City Project Manager (PM)shall have full contractual responsibility for all of Pilot equipment and verification testing activities and will work closely with the consultant and Integrator staff to ensure that the testing is accomplished properly.

The City's PM, or designated consultant staff, shall have the following roles and responsibilities:

1. Create and maintain all system verification and testing engineering related processes, policies and operating procedures for the Pilot.
1. Participate in all facets of testing activities and provide recommendations to the City for verification testing related aspects of the project.
2. Provide technical assistance to the Integrator and City staff during the testing process.
3. Provide regulatory guidance for security-related requirements in conjunction with the City management staff.
4. Maintain a liaison with City and Integrator staff to incorporate additional testing procedures and ad hoc tests into the Pilot verification and testing process.

INTEGRATOR SYSTEMS ENGINEERING STAFF

The Integrator systems engineering personnel for the Pilot shall have the following roles and responsibilities:

1. Develop the various test scripts and procedures that are required to effectively support the Pilot verification and testing process.

2. Perform the various tests that are required, detailing to the City Consultant each procedure that is being conducted and why.
3. Ensure that the various system and equipment testing requirements and processes are properly flowed down from the RFP and the Contract documents by utilizing comprehensive requirements trace matrix.
4. Develop a detailed testing report that identifies all of the tests that were run, any problems that were discovered and how those problems would be corrected.
5. Perform any required re-testing activities that are identified by City and Consultant staff.

TEST PLAN

TESTING STANDARDS

It should be noted that there are no true industry test standards for License Plate Recognition and magnetic stripe ticket projects of this type but there are commonly expected results from tests of parking equipment. These may vary upon location, but can generally be classified in the following categories:

- License Plate Recognition (LPR)
  - 90%* of human-readable plates should return a LPR result
  - Of these 90%* you should get a 98%* accuracy rate on the high end and a 95%* rate on the low end with an average accuracy of 96.5%*
- Paper tickets with magnetic stripes
  - Tickets should be 99.5% readable. (assuming non-damaged and acceptable stock)
  - Ticket Issuing Machines (TIMS) should write data, read and verify, rewrite if necessary, then issue.
- Credit Card Compliance
  - This category is the only one with a true industry standard. Credit cards use the Payment Card Industry (PCI) compliance which was introduced in 2006 and must be adhered to throughout the project.

* - *Note: The percentages above are derived only from license plates that are human-readable.*

TESTING TECHNOLOGIES

For the purposes of this pilot, no fewer than two (2) and no more than four (4) different technologies may be tested simultaneously. As an example, a system that uses standard cameras for LPR may be considered a different technology than a system that uses infrared cameras for LPR. In a similar example, systems that use the same LPR camera type but process the data received from the cameras in a different manner may also be considered a different technology. Within the same technology, several vendors may be tested simultaneously at the discretion of the City, with justification.

INTEGRATOR TEST PLAN

The Integrator shall prepare a detailed plan for testing all hardware, software and the full integration of the Pilot. The test plan shall be developed to confirm that the various functional requirements that are presented in the RFP, the system design documentation and the other Contract documents are met by the equipment and/or system operations. The Test Plan and subsequent testing activities shall be developed for each technology sampled as part of the Pilot. The tests that will be conducted by the Integrator, in the following order, are presented below:

1. Factory Acceptance Test (FAT);
2. On-site Integration and Commissioning Test; and
3. Operational Performance Test (see Appendix D-1)

The Integrator shall be responsible to develop comprehensive test scripts and test plans to determine how wll each technology meets the system requirements that are presented in the RFP and the other contract documents. The test scripts and plans will be reviewed and approved by City staff or its designated consultant. The test scripts and plans shall be closely adhered to during each phase of equipment and system testing. At the completion of each test, the Integrator shall submit final test results to the City for final approval. The City PM will approve the test results.

The City and their representatives will be permitted to participate in or otherwise observe any and all of these tests at the City's sole discretion. Tentative dates for conducting the various tests shall be included in the Test Plan document that shall be submitted by the Integrator during the system design phase of the Contract. Reasonable modifications to these dates may be permitted during the course of the work by the City provided a written request for such change is made at least two (2) weeks prior to the revised test date. The actual change approval must be granted, in writing, by the City.

EQUIPMENT ENVIRONMENTAL TESTING

As a preliminary effort prior to factory acceptance testing, the Integrator shall also provide test results, certified by a testing laboratory approved by the City, confirming that all proposed technologies to be tested are suitable to operate within its planned environment. If certified test results are not available or the results are not satisfactory to the City, the Integrator shall arrange for such tests to be conducted or re-conducted at no additional cost to the City. The Integrator shall provide the City with certified test results for all equipment that is to be used outside, or in any other non-environmentally controlled location. Environmental testing shall be waived for any equipment to be installed outside that is commercially-available and off-the shelf (COTS) and manufactured for external use as long as its specification indicates so. For equipment that is to be installed inside a building, cut sheets showing environmental operating requirements will be acceptable.

FACTORY ACCEPTANCE TEST (FAT)

The intent of the FAT, which will be held at the Integrator's system development office, or other location agreed upon by the City PM, is to allow the Integrator to conclusively represent that the Pilot equipment, subsystems and overall system complies with the system functional requirements. Representatives from the City and the consultant are expected to be present at the FAT. The FAT shall be successfully completed, and accepted by the City, prior to commencement of on-site equipment testing. Equipment and/or system failures that are encountered during performance of the FAT shall be resolved, retested and acknowledged as being resolved by the City prior to issuance of FAT approval to the Integrator.

Components used in the FAT shall be production models, which would otherwise be suitable for use by the City. Testing and careful evaluation of samples and prototypes shall be completed prior to the commencement of the FAT.

The FAT is the culmination of the design, development, fabrication and pre-test of the technologies. The FAT shall be performed by the Integrator under the supervision of, and with the participation of, the City. Performance of the FAT shall be witnessed by the City, and their representatives, with acknowledgment of scenario success and/or failure by the City.

The Integrator shall prepare detailed test scripts that will be used as the basis for the FAT. FAT Scripts shall cover test set-up, step-by-step procedures and pre-determined expected results. FAT scripts shall be submitted and approved by the City prior to the commencement of the FAT. FAT scripts shall be submitted for review and approval no less than 60 days prior to scheduling of the factory test.

The following are recommended features of the Pilot that are, at a minimum, to be demonstrated during the FAT:

- Equipment power up tests;
- Verify initialization;
- Verify data integrity (no loss of data);
- Verify diagnostic messages;
- Introduce failures and threats;
- Degraded mode performance;
- Verify diagnostic messages;
- Proper read of license plate;
- Communication link between the technology and the data repository;

- Generation of reports;
- Accuracy of data collection;
- Data analysis capabilities;
- Integrity checking;
- System audit; and
- Others yet to be identified.

Appendix C-6
Configuration Management Plan Guidelines

The objective of the Configuration Management process is to engage all vested stakeholders so that they will be informed of requests for changes to the Berkeley City's parking system and that they will have the opportunity to discuss the proposed any scope of change and its potential impacts on the system. Once a change is agreed upon and accepted, stakeholders can the change their design/implementation as needed.

During the Pilot, the Integrator shall present a configuration management plan that addresses the following topics:

- All Pilot stakeholders are notified of pending changes to the Pilot system/software,
- All Pilot stakeholders are notified of why the changes to the Pilot system/software are needed,
- To maintain data continuity, changes made to the Pilot system/software during the testing period shall not affect the method of data collection or alter the types of data collected, and

A log of all changes made to the Pilot system/software during the testing period along with the resulting outcomes, shall be distributed to all Pilot stakeholders as they occur.

The configuration management plan requirements for the final parking system selected by the City will be clearly described in the RFP so that the Integrator will be prepared to address, as a minimum, the following:

The Configuration Management process shall be defined to ensure that:

- The Berkeley City's parking system Pilot test configuration is managed;
- Changes to the Test Configuration are only made with appropriate consideration under the authority of the Berkeley City's project management team;
- Accurate and all-inclusive configuration records are maintained;
- Berkeley City's parking staff, subcontractors and vendors are made aware of pending system changes.

Appendix D

Phase 2 Purchase and Implementation Guidelines

Once the goBerkeley pilot testing has been completed, and the technology performance scored, a preferred solution will be presented to the City. As part of Phase 2 of the VPPP, upon the City's selection of one or two of the tested technologies, a Best and Final offer process shall begin with each selected Vendor to secure costs for the supply and implementation of the selected technology(ies). A decision to implement two technologies would be made by the City only if the test results indicated that the City's goals of data collection and enforcement could not be adequately met by a single technology.

The goBerkeley pilot implementation shall follow and be subject to the guidelines set forth in this Appendix as they relate to:

- Quality Management Plan Guidelines (see Appendix C-1)
- Verification Plan Guidelines – Phase 2
- Operations, Maintenance and Support Plan Guidelines
- Deployment Plan Guidelines
- Training Plan Guidelines

Appendix D-1
Verification Plan Guidelines – Phase 2

GENERAL

This document will present the Pilot equipment and system verification testing process. It will outline the different types of tests that shall be conducted and identify the roles and responsibilities of each group that will be working on this project.

Roles and Responsibilities

Based upon the recommended distributed responsibility for the successful implementation of test procedures to ensure that the delivered technology operates according to the Request for Proposal (RFP) and Contract requirements, the Pilot organization will have various roles and responsibilities. Listed below are recommended starting points for defining organizational responsibilities pertaining to the verification test activities that are required to ensure program success.

CITY PERSONNEL AND/OR PROJECT CONSULTANT STAFF

The City Project Manager (PM)shall have full contractual responsibility for all of Pilot equipment and verification testing activities and will work closely with the consultant and Integrator staff to ensure that the testing is accomplished properly.

The City's PM, or designated consultant staff, shall have the following roles and responsibilities:

1. Create and maintain all system verification and testing engineering related processes, policies and operating procedures for the Pilot.
2. Participate in all facets of testing activities and provide recommendations to the City for verification testing related aspects of the project.
3. Provide technical assistance to the Integrator and City staff during the testing process.
4. Provide regulatory guidance for security-related requirements in conjunction with the City management staff.
5. Maintain a liaison with City and Integrator staff to incorporate additional testing procedures and ad hoc tests into the Pilot verification and testing process.

INTEGRATOR SYSTEMS ENGINEERING STAFF

The Integrator systems engineering personnel for the Pilot shall have the following roles and responsibilities:

6. Develop the various test scripts and procedures that are required to effectively support the Pilot verification and testing process.
7. Perform the various tests that are required, detailing to the City Consultant each procedure that is being conducted and why.

8. Ensure that the various system and equipment testing requirements and processes are properly flowed down from the RFP and the Contract documents by utilizing comprehensive requirements trace matrix.
9. Develop a detailed testing report that identifies all of the tests that were run, any problems that were discovered and how those problems would be corrected.
10. Perform any required re-testing activities that are identified by City and Consultant staff.

OPERATIONAL PERFORMANCE TEST

The final phase of testing of the Pilot is the OPT. This test shall serve to closely monitor the performance of the technologies under operating conditions. Activities during this period of testing will include all necessary scripted test documentation, unscripted ad-hoc tests as well as monitoring of day-to-day functions of the Pilot.

The OPT shall be conducted over a 30-day continuous period without degradation in performance or failure in compliance with contract system requirements. Throughout the 30-day test period any system problems, errors, failures or malfunctions that are not in compliance with the contract requirements shall be categorized based on its level of severity. The typical four (4) levels of severity are:

Severity 1 – Hardware or Software component or process that is critical to the operation of the long-term parking management system that does not function and there is the possibility of loss of revenue and/or loss of data.

Severity 2 – Hardware or software component or process that does not function. There is no risk of loss of revenue or data; however there is the possibility of negative impact to patron usage.

Severity 3 – Hardware or software component or process that does not meet the design functionality and/or impedes the operation of the system but does not affect the collection of revenue or negatively impact the patron usage.

Severity 4 – Hardware or software component or process that does not meet the design functionality and/or is "cosmetic" in nature. Failure is transparent in nature to both the patron and the City.

The success or failure of the 30-day OPT shall be determined by the number and type of severity levels encountered during the test. The following represents the impact of each of the severity levels on the eventual outcome of the test.

SEVERITY 1

Indicates a failure of the 30-day test.

The 30-day test is stopped. Once the problem is resolved, the 30-day test is restarted from Day 1.

Milestone payments regarding the 30-day test are withheld.

Warranty period will not begin until successful conclusion of the OPT.

SEVERITY 2

Does not indicate a failure of the 30-day test.

The 30-day test is stopped. Once the problem is resolved, the 30-day test will resume from the date in which it left off. Once the problem is resolved the implemented fix shall operate without flaw for seven (7) consecutive days, which may extend the 30-day test period.

Milestone payments regarding 30-day test will be withheld.

Warranty period will not begin.

Reoccurrence of the same problem that should have been resolved might raise the level of the issue to Severity 1.

SEVERITY 3

Does not indicate a failure of the 30-day test.

The 30-day test is stopped. Once the problem is resolved, the 30-day test will resume from the point in which it left off. Once the problem is resolved the fix shall operate without failure for a minimum of seven (7) consecutive days, which may extend the 30-day test period.

Milestone payments will continue to be paid to the Integrator.

The Warranty Period will not begin.

SEVERITY 4

Does not indicate a failure of the 30-day test.

The 30-day test is not stopped. The problem is resolved in a timely fashion.

Milestone payments will continue to be paid.

The Warranty Period will not begin.

Verification that all reported problems have been resolved will be obtained using several methods, including event logs and service call logs and other additional information that can be gleaned from maintenance log maintained by the Integrator or other data sources approved by the City. Multiple meetings per week will be scheduled during the 30-day test to ensure that the City is fully aware of all system and equipment failures and the meetings will provide a forum in which City and Integrator staff can review system/equipment failures and classify the severity levels.

Appendix D-2
Operations, Maintenance and Support Plan Guidelines

During the Pilot, the Integrator shall present an operations, maintenance and support plan that shall be similar to the Data Collection and Evaluation Plan, the Guidelines for which are set forth in Appendix C-3.

To accomplish this, the Integrator selected to perform the testing shall develop a plan that details:

- How the multiple technologies will be mounted on the test enforcement vehicle,
- How the electronically collected data will be recorded in the test enforcement vehicle and then transferred to an external network for analysis.
- How the manually collected data will be recorded in real-time in the test enforcement vehicle and then converted to an electronic form and posted to an external network for analysis.

The Integrator shall develop an evaluation plan to examine the electronic and manually collected data. The resulting data and evaluation plan developed by the Integrator shall enable them to make recommendations to the City as to which technology solutions would be the most accurate, reliable, easy to operate, and maintain. The evaluation plan shall include but not be limited to the following:

- For each technology/system tested, an overall comparison of accuracy when compared to the baseline manually collected data,
- For each technology/system tested, a log of each preventative maintenance event along with any associated labor/material costs, and
- For each technology/system tested, a log of each non-preventative maintenance event (repair) along with any associated labor/material costs.

In addition, for the Pilot the Integrator shall present plans that discuss:

- Personnel that will be responsible for conducting the testing,
- Personnel that will be responsible for maintenance of the systems,
- How repair and maintenance issues will be handled and escalated, and
- Lines of communication and points of contact for the operation and maintenance of the test system.

The operations, maintenance and support plan requirements for the final parking system selected by the City will be clearly described in the RFP so that the Integrator will be prepared to address, as a minimum, the following:

System Operations

- Overview of System and Capabilities
- Parking Meters
- Pay Stations

Back Office Operating System

Parking System Maintenance

- Internal Training and Support
- Parking System Integrator Support
- Parking System Vendor Support

Appendix D-3
Deployment Plan Guidelines

The Pilot test Integrator's deployment plan shall detail the project's schedules that document the installation of various components of equipment and subsystems necessary for the Pilot system to operate effectively. This work plan shall include detailed schedules in Microsoft Project that demonstrate the Integrator's internal management tools and will also list the project's major milestones. The project's installation plan shall clearly detail the anticipated timing of initial deployments, field testing and debugging along with the sequencing of other deployment activities.

The deployment plan guidelines for the final parking system selected by the City will be clearly described in the RFP so that the Integrator will be prepared to address, as a minimum, the items described for the Pilot test in addition to the following:

- Project initiation
- Contract start (NTP)
- Project kick-off meeting
- Integrator preparation of updated project plan
- Integrator preparation submission of updated project plan
- Review and approval of updated project plan by City
- Contract administration

Appendix D-4
Training Plan Guidelines

The training plan for the final parking system selected by the City will be clearly described in the RFP so that the Integrator will be prepared to address, as a minimum, the following:

- Development of a training plan for enforcement officers that addresses
    - Training for use of in-vehicle enforcement equipment
    - Training for use of handheld enforcement devices
- Development of a training plan for enforcement managers and supervisors
- Development of a training plan for adjudicators
    - Investigation into payments
    - Investigation into meter status
- Certification process for training